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ABSTRACT

The primary objective of this research was to provide fundamental information about the relationship between social milieu, preschool experience, and children's ability to perform logical thinking tasks, and also about the implications of these factors for educational programs pertaining to the development of preschool teachers and administrators. The research was carried out in the Kingdom of Swaziland, Africa, during the 1984-85 academic year. A total of 402 subjects from preschool, first, second, and third grades were given manipulative materials that were culture appropriate. They were then given a series of questions about the materials in their mother tongue. Findings regarding socioeconomic status and preschool influence are described and specific suggestions for teacher training are provided. (Author/MT)

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SOCIO-ECONOMIC IMPLICATIONS OF RESEARCH FOR PRE-SCHOOL TRAINING PROGRAMS

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SOCIO-ECONOMIC IMPLICATIONS OF RESEARCH
FOR PRE-SCHOOL TRAINING PROGRAMS

Abstract

The research reported here was carried out in the Kingdom of Swaziland, Africa. The relationship of preschool attendance to the child's success in completing logical thinking tasks was examined. Socio/economic levels of children's parents, sex differences, and comparison of urban and rural subjects were also carried out. A total of 402 subjects from preschool, first, second and third grade were given manipulative materials that were "culture appropriate". They were then given a series of questions about the materials in their mother tongue. The findings regarding socio/economic status and pre-school influence are described in detail in the research report. Specific suggestions for teacher training based on these findings are provided at the conclusion of the paper.

SOCIO-ECONOMIC IMPLICATIONS OF RESEARCH FOR PRE-SCHOOL TEACHER TRAINING PROGRAMS

by

Martha Tyler John and E. Nokulunga Nksibandze

RATIONALE

In recent years, several social and economic factors have combined to make pre-school education an important consideration for education personnel development. Factors such as increased urbanization, more working mothers, and greater emphasis on cognitive development in younger children have added pressures on governments to provide pre-schools and to assist in the cost of operating those schools.

This places a heavier burden on the educational budget and also has an impact on the curriculum content of institutions that train eduation personnel. A group of pre-school teachers and specialists will be needed and this will have an impact on the long range manpower requirements.

The assumption has been that pre-school education is good to have and, in the technological environment of an urban society, pre-school training may even be necessary to begin the acclimatization of children to an educational setting as soon as possible. Considering the costs and investments associated with pre-school education, it would be advisable to investigate the underlying assumptions regarding the value of pre-school training and to see what the implications of those assumptions are.

The primary objective of the research reported herein was to provide fundamental information about (1) the relationship between social milieu, pre-school experience, and children's ability to perform logical thinking tasks, and (2) the implications of these factors for educational programs pertaining to the development of pre-school teachers and administrators.

National Need

In recent years Swaziland has been undergoing changes similar to those taking place in many other countries. The movement of the population to urban areas and changes in living conditions have affected child-rearing practices. The education of children is no longer the total responsibility of the family. Children now spend long hours at school. Those who live in rural areas are closer to the traditional forms of upbringing than those in the urban areas. But, in general, the setting in which children acquire concepts and demonstrate their ability to perform a variety of tasks is different.

Because children receive much of their education in public schools, the Ministry of Education in Swaziland has been attempting to upgrade the quality of the educational system, and this includes improving the teacher training programs and curriculum development projects at both the preschool and primary levels. A Senior Inspector of Preschools has been appointed and curricular material has been developed for preschool teacher

education, and for preschool children. The existing preschool programs are also undergoing extensive evaluation.

RELATED RESEARCH

Piaget Research in Africa

A number of Piaget replication studies have been done in Africa to determine the universality of Piaget's theory, and to discover the effects of environment on children's ability to perform specified logical thinking tasks. Dasen (1977), Wober (1975), Warren (1977), and Werner (1979) have raised questions about the effects that Euro-Western contact may have on the child's ability and/or motivation to perform logical thinking tasks. Dasen (1977) states the case strongly when he says that "...the variable of "European contact" may form a continuum which is directly related to the "rate" of development of concrete operations (or at least the performance on concrete operational tasks)" (p.183). Summaries of the cross-cultural Piaget research can be found in the references cited above.

Male/Female Research

Sex differences in cross-cultural studies in performance on Piagetian tasks have been investigated by several researchers. Bliss and Docherty (1979) found no significant difference between boys and girls in their ability to complete the tasks logically. However, Otaala (1973) stated that among his subjects the boys were

"decidedly better than girls" (p.71). He attributed this superiority to differences in upbringing, particularly the expected age of compliance - the idea being that females have strong compliance codes applied whereas males are expected to demonstrate more independence, up to a point. Fahrmeier (1978) and John et al (1983) all found differences between the sexes.

Socio/Economic Influences

The socio/economic status of parents has been examined by a limited number of researchers. Lwango-Lukwago, (1982) found that the socio/economic status of the parents correlated with different degrees of success on territorial decentration tasks for children in Kenya. "Boys and subjects from lower socio-economic categories are respectively more territorially decentered than girls and subjects from higher socio-economic categories" (abstract, vi). He found that the remote rural subjects were the most territorially decentered, while the least decentered were the subjects from the urban Nairobi region. It would appear that youngsters in a rural setting explore their environment and become acquainted with its varied components much more than the confined child. This raised the question of over-protection and the relationship of confinement to cognitive development. The present study has determined the socio/economic level of the subjects' parents in an attempt to add to the body of information about this variable.

Urban/Rural

Several studies have investigated the variable of urbanization where Euro-Western contact often occurs. There have been mixed results on the overall effects of urbanization, however, depending somewhat upon the type of tasks being examined. Fahrmeier (1978), Halligan (1979), Okonji (1971) and John et al (1983) have examined the urban/rural variable. For a comprehensive discussion of this research see " Boleswa", Vol.2.

The research done in Swaziland has examined the urban/rural variable to determine whether environmental influences such as socio-economic status and urban/rural living conditions have a significant influence on success in logical thinking tasks.

Preschool Research

The preschool child is growing rapidly and is just beginning to adjust to the larger world. Physically, intellectually, and socially the child is changing. But what are the effects of schooling on a young child? Recently a long-term study of preschool effects was completed in the United States. While the results of this study cannot be applied directly to the preschools in Swaziland, some of the findings may be relevant. It was found that, "Preschool education contributed to increased scholastic achievement during the years of elementary and middle school as measured by standardized achievement tests" (Berrueta

et al, 1984, p.24). "In the Perry Preschool study, persons who had attended preschool had better grades, fewer failing marks, and fewer absences in elementary school; they required fewer special education services, were most likely to graduate from high school, and were more likely to continue their education or get vocational training after school than their non-preschool counterparts" (1984, p.40). These statements raise high hopes for preschool attenders. However, the researchers build in a word of caution. They say that "The best documented immediate effect of preschool is an improvement in the child's intellectual performance, an effect that usually lasts no more than a few years" (Berrueta et al, 1984, p.4).

The research conducted in Swaziland has examined the effects of preschool on children's ability to complete logical thinking tasks successfully. Grades 1 and 2 and Standard 1 (which is Level 3) were also examined. This would help establish the endurance of the preschool effect.

METHOD

Population

The study was carried out in the Kingdom of Swaziland in Southern Africa. There are four major districts in Swaziland so approximately equal numbers of subjects were selected from each district. The sample contained 402 subjects.

The distribution of the actual sample of subjects by

SUMMARY OF POPULATION SAMPLE

DISTRICTS	Students
HHOHHO	125
LUBOMBO	89
MANZINI	102
SHISELWENI	86
TOTAL	402

MILIEU	Students
URBAN	222
RURAL	180
TOTAL	402

SEX	Students
MALE	184
FEMALE	220
TOTAL	402

LEVEL	Students
PRESCHOOL	100
GRADE 1	99
GRADE 2	100
GRADE 3(STD.1)	103
TOTAL	402

PRE/NON PRESCHOOL	Students
PRESCHOOL ATTENDERS	172
NONPRESCHOOL ATTENDERS	129
UNKNOWN	101
TOTAL	402

SOCIO-ECONOMIC	Students
HIGH INCOME	43
LOW INCOME	50
MIDDLE INCOME	187
UNKNOWN	122
TOTAL	402

NUMBER OF STUDENTS BY AGE DISTRIBUTION

AGES										
4	5	6	7	8	9	10	11	12	13	TOTAL
26	67	73	57	72	55	30	17	4	1	402

TABLE 1

district, sex, preschool/non-preschool, milieu, grade, socio/economic background and age are given in Table 1.

Procedure

The researchers worked with university students as a data gathering group. Instructions were provided for the group in the form of actual demonstrations on the use of questioning and recording procedures. Scripts in both English and siSwati were provided along with standard data collection sheets.

Six Piaget tasks were selected and concrete materials for use with the subjects were developed in "kit" form so that each of the data collectors could have his/her own set of materials. The tasks and the materials selected to represent them were as follows:

Classification ---- 4 doll dresses - 2 trousers
superordinate category - clothes
Seriation --------- 8 rondavels (huts) of graduated size
8 sticks of graduated sizes
Conservation of:
Number ------- 16 sweets (wrapped and alike)
Length ------- 2 strips of cardboard of identical length, marked like roads
2 matchbox cars
Weight ------ 2 balls of clay - kitchen scales
Multiple Grouping - 9 shapes - 3 colours (red, blue and yellow); 3 sizes; and 3 different shapes (circle, triangle, and square)

Data collection sheets were prepared in multiple copies and the subject's name, age, sex and grade level were recorded at the beginning of each interview session. The subject was asked whether he/she had attended creche (preschool). In addition, the researchers obtained information about the socio/economic

status of each child from the Headmaster at each school. Poor, middle income, or well-to-do families were identified by school personnel.

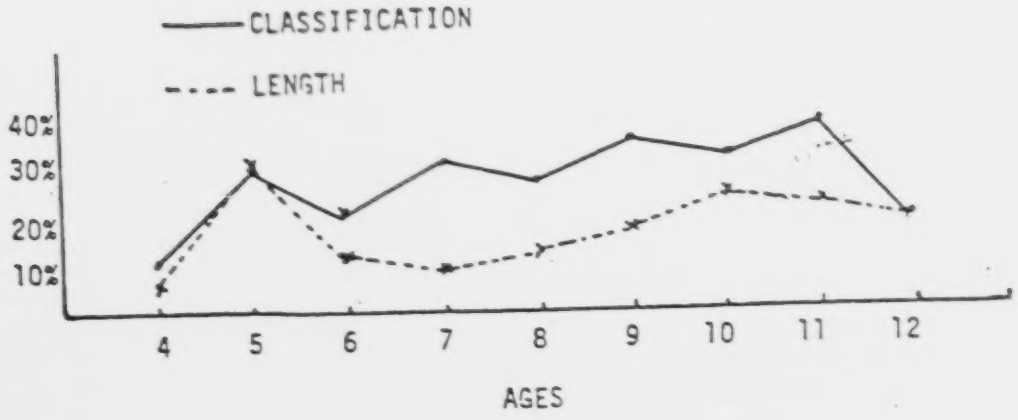
The actual interviewing of the children took place in the principal's office, or other provided space. Tables and chairs were set up with materials and children came to be interviewed one at a time. Each subject was interviewed separately for 20-30 minutes. Subjects were shown manipulanda and given the opportunity to arrange items as they wished; then, they were asked questions about it.

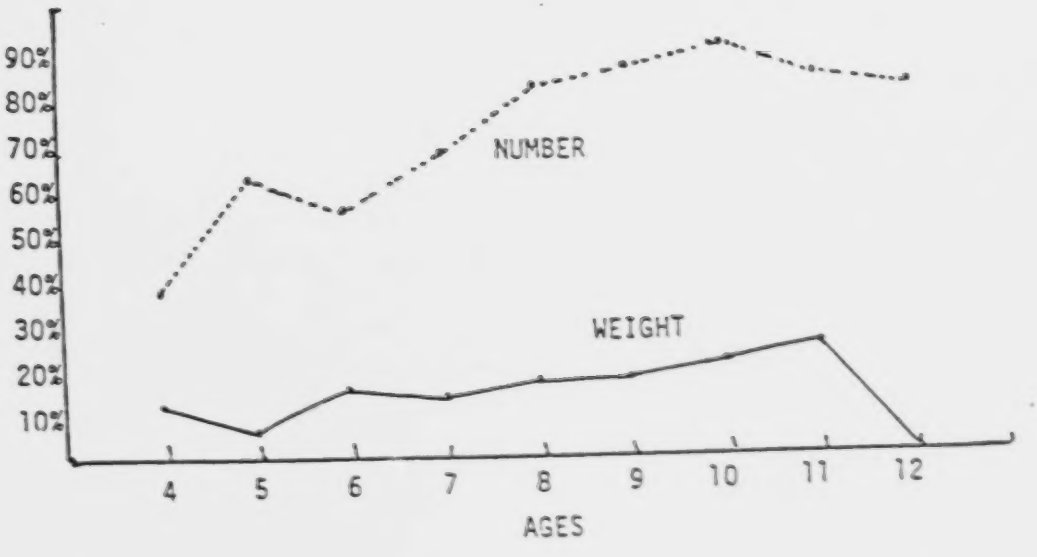
Lists of pupils that were to participate were prepared using a table of random numbers. The tasks were presented in mixed order, and the pupils were questioned in their "mother tongue".

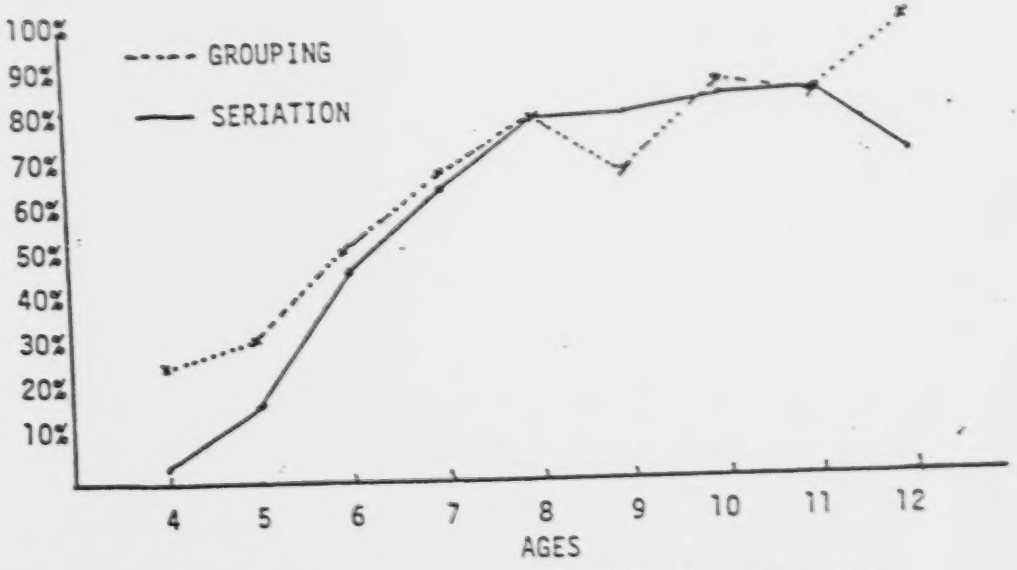
RESULTS

Personal data and subject responses on the various Piagetian tasks were collected and entered in a computer data base. The information was then analyzed in several ways to determine the relationship of each of these variables to children's success on logical thinking tasks.

The percentages of pupils who successfully complete the tasks are plotted as a function of the ages of pupils in Table 1. It can be seen that there is a general tendency for the performance to improve as the age increases although there are statistical variations evident. It should be noted that the sample of 12 and 13 year old pupils has been grouped together.







PERCENTAGES OF PUPILS SUCCESSFULLY COMPLETING TASKS SUMMARIZED BY AGES

Age differences were taken into consideration in the analysis because of the different numbers of pupils in the various age groups, and the fact that the percentage of pupils successfully completing the tasks varied from one age group to another. It was necessary to make adjustments when comparing data from different age groups. Cochran's Y statistic (see: Light, and Margolin, 1971) was used to make this adjustment when results were compared over various age groups.

The proportions of pupils successfully completing tasks were also compared for fixed ages. For example, within a fixed age group, a comparison would be made between male pupils from different milieu (urban/rural) or different socio-economic backgrounds (high/low incomes). The normal approximation was used to compare the proportions.

In all of the summaries, male and female results were separated and then comparisons were made to see if there were differences based on sex. When no significant differences were found between males and females, results were pooled to make other comparisons.

A comparison was made between male and female pupils for the six tasks. The analysis indicated the differences between sexes were not statistically significant; however, the proportion of successful males was consistently higher than the proportion for females. The pooled results (combining males and females) are shown in Figure 1.

COMPARISONS BETWEEN MALE AND FEMALE PUPILS

PERCENTAGE SUCCESSFULLY COMPLETING TASKS

	CLASSIFICATION	LENGTH	WEIGHT	NUMBER	SERIATION	GROUPING
MALE	30%	18%	15%	71%	60%	62%
FEMALE	28%	13%	12%	68%	56%	59%

FIGURE 1

COMPARISONS BETWEEN PUPILS FROM HIGH AND LOW INCOME FAMILIES

PERCENTAGE SUCCESSFULLY COMPLETING TASKS

	CLASSIFICATION	LENGTH	WEIGHT	NUMBER	SERIATION	GROUPING
HIGH INCOME	27%	23%	13%	60%	41%	51%
LOW INCOME	32%	14%	12%	72%	48%	64%

FIGURE 2

COMPARISONS BETWEEN URBAN AND RURAL SCHOOLS

PERCENTAGE SUCCESSFULLY COMPLETING TASKS

	CLASSIFICATION	LENGTH	WEIGHT	NUMBER	SERIATION	GROUPING
URBAN	27%	14%	14%	76%	70%	58%
RURAL	33%	14%	16%	71%	73%	63%

FIGURE 3

Another comparison was made between pupils from different socio-economic backgrounds. Information was not available for 122 of the pupils, so only 280 were included in the sample. It was decided that only the extremes would be compared, so 50 pupils from low income families were compared with 43 pupils from high income families. The results are shown in Figure 2. No differences were found between males and females, so the pooled results were used to compare the performance of subjects from low and high income families. Pupils from low income families had a higher success percentage on four of the six tasks. However, the differences between success percentages were not statistically significant for any of the tasks.

To determine possible effects of milieu (urban/rural areas), results for subjects in the different areas were compared. The differences between male and female subjects were not significant, so again, the pooled comparisons between urban and rural areas were made. The results are shown in Figure 3.

Figure 4 shows the comparison between those who attended preschool and those who did not. There were no differences between sexes, so the pooled results are shown. Surprisingly enough, the non-preschool attenders achieved a higher success percentage than those who attended preschool in all the tasks except Classification.

An investigation of the interaction between socio-economic factor and attendance in preschool was also made. Subjects from high income families were divided into two groups, those who had

COMPARISONS BETWEEN PRESCHOOL AND NON-PRESCHOOL ATTENDERS

PERCENTAGE SUCCESSFULLY COMPLETING TASKS

	CLASSIFICATION	LENGTH	WEIGHT	NUMBER	SERIATION	GROUPING
PRESCHOOL ATTENDERS	34%	6%	9%	64%	55%	38%
NON-PRESCHOOL ATTENDERS	31%	14%	17%	77%	75%	78%

FIGURE 4

COMPARISONS BETWEEN PRESCHOOL AND NON-PRESCHOOL ATTENDERS

FROM HIGH INCOME FAMILIES

PERCENTAGE SUCCESSFULLY COMPLETING TASKS

	CLASSIFICATION	LENGTH	WEIGHT	NUMBER	SERIATION	GROUPING
PRESCHOOL	34%	26%	7%	65%	23%	34%
NON-PRESCHOOL	17%	17%	23%*	52%	70%*	76%

* Differences are significant at the .05 level

FIGURE 5

COMPARISONS BETWEEN PRESCHOOL AND NON-PRESCHOOL ATTENDERS

FROM LOW INCOME FAMILIES

PERCENTAGE SUCCESSFULLY COMPLETING TASKS

	CLASSIFICATION	LENGTH	WEIGHT	NUMBER	SERIATION	GROUPING
PRESCHOOL	23%	19%	9%	61%	19%	43%
NON-PRESCHOOL	37%	10%	13%	79%	68%*	79%*

*Differences are significant at the .05 level

FIGURE 6

attended preschool and those who had not. The results are shown in Figure 5. Likewise, subjects from low income families were divided into those groups and the results are shown in Figure 6. Comparisons were made between preschool and non-preschool attenders within the two income groups and some of these variations were even more pronounced than when the groups were combined. The statistically significant differences are indicated in the figures.

Information regarding attendance in preschool was not available for all the pupils. Over one hundred (101) of the pupils were not sure if they had attended preschool (creche) so they could not be included in the sample. The 100 pupils attending preschools could be included in the group of preschool attenders, but there was no comparable age group of non-preschool attenders, so only the 201 subjects in Grades 1, 2 and 3 were considered for the preschool and non-preschool comparison.

CONCLUSIONS

We have examined the influence of several variables on pupil's ability to successfully complete six (6) logical thinking tasks. The variables were sex, preschool and non-preschool attendance, urban and rural differences, and socio/economic level of the family. In connection with each of these variables the ages and grade levels of the pupils were taken into consideration.

It can be seen from the results that males and females did not demonstrate significant differences in the successful completion of any of the tasks. There was a slight trend in favor of the males, however, on all tasks.

In an attempt to determine the influence of milieu two comparisons were carried out. Urban and rural comparisons were made. The differences were slight on all tasks, but the rural sample performed slightly better on classification, weight, seriation and grouping. Urban subjects performed somewhat better on conservation of number. In a second comparison between high and low income families, low income pupils outperformed high income pupils on classification, number, seriation and grouping. It is possible that children from lower income families explore their environment more actively. This would be in keeping with the findings that Lwanga-Lukwago (1982) observed in his study in Kenya.

The ages at which pupils successfully completed tasks were found to differ from the Piaget sample in some cases. Subjects in the sample performed well on conservation of number, and seriation, as well as the grouping task. They were older when they successfully completing classification tasks and conservation of length and weight.

When comprising preschool and non-preschool attenders it was found that the non-preschool attenders performed better on five tasks, namely: length, weight, number, seriation and grouping. The preschool attenders performed better on the classification

task. When high and low income families were compared, the high income non-preschoolers performed significantly higher (.05) on the grouping task, and there was a trend in favor of the high income non-preschoolers on the seriation and the conservation of weight tasks. It is important to remember that the third graders (Standard 1) had been preschool attenders three or four years ago when the programs were just beginning to be developed. There can be little doubt that the programs have improved in the years following.

IMPLICATIONS FOR TEACHERS

This research has implications for teachers and so, applies directly to teacher training programs, as well. It points out clearly that:

1) children differ in ability to complete logical thinking tasks.

2) more practice may be needed for logical thinking tasks where performance does not reflect the skill level desired for a specific grade or age level. (Piaget does indicate that both age and experience help create cognitive growth.)

3) there may be sex differences in logical thinking ability.

4) teachers need to involve pupils actively in the world around them. Experimenting, asking "why" questions and using real life objects in classroom learning situations might modify socio/economic influences and provide better learning conditions for all children.

5) attending preschool does not automatically produce a higher quality of cognitive performance. "The development of programs of high quality is a priority for those dedicated to delivering on the promise of such child care and education projects as the Perry Preschool Project" (Perry Study, 1984, p. 109). The government of Swaziland has been demonstrating an increasing emphasis on the development of quality preschool programs.

6) a number of peripheral elements related to the successful operation of a preschool need to be taken into account. Ten critical areas for high quality programs are suggested by the National Association for the Education of Young Children (1983, pp. 35-46). These ten areas are: physical environment, health and safety, nutrition and food service, administration, staff qualifications and development, staff-parent interaction, staff-child interaction, child-child interaction, curriculum and evaluation.

The study reported here has provided some interesting insights into early childhood education, and into the effects of socio/economic influence. The findings should be of value to those who are involved in early childhood education in the Kingdom of Swaziland and in other countries. They should also be useful to theorists who are extending the applicability of Piaget's theory, and to people who have leadership roles in establishing pre-school programs. If such programs are to be successful and truly benefit children, a comprehensive educational program must be designed where parents, teachers and children are all involved. The investment of government resources in buildings and in curricular materials as well as teacher training programs will also be needed.

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